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Stock Returns by Sector and Industries in a Year into the COVID-19 Pandemic

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STOCK RETURNS BY SECTORS AND INDUSTRIES A YEAR INTO THE COVID-19 PANDEMIC

by

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ABSTRACT

In the COVID-19 stock market industries reacted and were affected in different ways. This paper will use Standard Industrial Classification (SIC) codes to look at how sectors and selected industries fared after a whole year in a pandemic. This will be accomplished by comparing 2019 stock returns to 2020 stock returns with a t-test and estimating the effect of COVID-19 positive case and death increases using a pooled OLS regression. All SIC sectors A-J were analyzed as well as 18 selected industries such as food stores, real estate, oil and gas extraction, health services, and communications. Results show a significant variation in the monthly returns of 2019 and 2020. Regression results show that there is a small but positive correlation of sector and industry returns to COVID-19 positive case and death increases. This contrary result can confirm the short influential window of COVID-19 outcomes on the stock market as shown in related research. This also confirms that regardless of the continued escalation of the pandemic, the stock market follows sentiment, not substance. This paper will contribute to the existing literature by conducting a yearlong event study of the United States' sectors and industries during the COVID-19 pandemic.

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Introduction

The COVID-19 pandemic has caused a severe global economic recession. The spillover effect of the pandemic has created volatility for financial markets across the globe, and this is due to many major industries being hit hard by social distancing and lockdown policies (Ozilli & Arun, 2020). Most industries like hospitality, utilities and services, and energy had significant negative returns when COVID first hit while other industries like communications, health care, and tech had many positive returns (Nguyen, 2020; Goodell & Huynh, 2020; Mazur et al., 2021). This paper will contribute to the existing literature about the effect of COVID-19 outcomes on certain sectors and industries in the stock market. To proxy for COVID-19 outcomes, we will use case data from the Centers for Disease Control and Prevention (CDC) about positive COVID-19 cases and COVID-19 related deaths. This will also contribute to the continued study of substance vs sentiment as factors influencing the stock market. At the time of this writing, there have been no unique research papers studying the yearlong COVID-19 effects on sectors using SIC codes and a pooled OLS regression methodology.

Pandemic-induced Recessions

Pandemics are not a new shock the stock market has not faced before. One of the more recent pandemic scares was the Ebola outbreak in 2014-2016. Ichev & Marinc (2018) showed that if an industry had news that was geographically proximal to the regions of the Ebola outbreak that it increased the relevance of the news which therefore had an impact on certain industry stock returns. On the day the outbreak was announced almost all US industries returned negative coefficients except those in the healthcare equipment, pharmaceutical, biotechnology, and food & beverage industries.

Another commonly referenced pandemic-induced recession was the Spanish Flu that occurred during the recession of 1918. Burdekin (2020) did a panel regression and found that there was a stronger relationship between the death rate and the country's stock indices returns in the Spanish Flu pandemic than during the COVID-19 pandemic. However, it was also recognized that there were World War 1 (WWI) wartime pressures during the event study of 1918-1919 which may have magnified the economic disruptions caused by the Spanish Flu or vice versa.

While it is relevant to look at these other pandemic-induced recessions, we must remember that this COVID-19 pandemic is a unique all-encompassing pandemic that has affected practically every country in the world. Breitenfellner and Ramskogler (2020) have compared the 2020 recession to the ones in 2008 and 1918 (Great recession and Spanish Flu/Post-WWI Recession respectively) and have made several important comparisons. For starters, the prioritization of public health is better today, and medical advancement has allowed for more effective treatment than in war times. Another important comparison is that the 2020 pandemic unfolded quicker than past recessions like in 2008 or the Great Depression. This creates another important differentiation from previous recessions which is that crises hit countries at different times. In the 2008 housing crisis, a recession in America caused a ripple effect that was not felt in places like the UK until 2009 while in comparison the spread of COVID-19 from China to the US occurred in under about a month. Also, during the 2008 housing crisis China lead the way for other emerging markets and became a more dominant force not being affected by the recession negatively. A final comparison that Breitenfellner and Ramskogler (2020) made was that in the 2020 recession the service sectors were hit a lot quicker than production sectors even though all sectors soon followed.

Industries during COVID-19

A study by Ozilli and Arun (2020) found that the two main methods that contributed to a health pandemic causing a global recession were the transmissibility of the virus causing social distancing/lockdown policies and the uncertainty created in investors caused by the exponential increase in cases. The former method has hit certain businesses and industries harder than others. Many sectors have not developed digital channels for social-distanced work or consumption while others like banking, entertainment, and grocery sectors already had previous experience with digital channels which helped them get a step ahead of other sectors (Baig et al., 2020). Bartik et al.'s (2020) firm-level surveys found that the composition of remote work varies from industry to industry, and that remote work is more common in industries with better educated and better-paid workers. These industry results show that not all industries were prepared for a global pandemic which is why there is so much discrepancy in the stock returns on different industries.

There were many studies in the recent year discussing the effects of COVID-19 on industries. The most prevalent ones were either focused from a global perspective or on a specific country only. Nguyen (2020) dealt with the global perspective and compared 11 sectors in over 10 countries in the first 10 weeks of 2020. They found that sectors that did relatively well in those first 10 weeks were communication services, consumer staples, health care, information technology, and utilities (the latter except in Italy, Japan, and the US). The sector that mainly suffered around the world was energy.

Other studies focused on specific country effects of COVID. In India, Rakshit et al. (2020) studied the qualitative effects of COVID-19 on the industries of the primary, secondary, and service sectors. It predicted that the contribution of each sector is based on the GDP of India

which shows how damaging COVID-19 can be on these specific sectors. In China, Pinglin et al. (2020) found that the more traditional industries of China like transportation, mining, electricity & heating, and environment industries have had negative returns due to the pandemic while the more tech-oriented industries such as manufacturing, IT, education, and healthcare industries have been more resilient in the pandemic. In the United States, Mazur et al. (2021) and Goodell and Huynh (2020) found similar results with services and utilities and the hospitality industry having negative abnormal returns while industries like healthcare had positive abnormal returns. Mazur et al. (2021) also studied the volatility of industries affecting the stock returns, and in general, found that loser stocks typically showed extreme volatility causing bad stock returns.

Industries of interest

For the purpose of relevance, we will choose to investigate industries that currently have papers addressing the changes in the industry during COVID-19. Overall, we look at all the 10 SIC code sectors and 18 selected industries. The full list of sectors, industries, and their descriptions can be found in Tables 1 and 2 in the data section.

One of the hardest-hit sectors was the services sector. The social distancing policies and lockdowns enforced due to COVID-19 have truly hindered the ability to provide services especially for those businesses that could not easily translate into a new online environment. Some lesser-known services affected were personal services, business services, and educational services industries. Small businesses found in the personal services industry typically had a difficult time protecting job security and government policies did not help them (Lin et al. 2021). Brinca et al. (2020) show that these service industries were mainly affected by a supply shock caused by the inability to provide their full services.

Another sector that was affected by this supply shock was the retail trade sector containing industries like restaurants, food stores, and general merchandise stores. They were all affected by pressures affecting the supply chain such as restrictions placed between regions limiting the distribution of staple products, increased cost due to concern of the safety of product flow from manufacturers to customers, and absence of migrant workers due to sickness or travel restrictions (Aday & Aday, 2020; Rio-Chanona et al, 2020) Regardless of these pressures, the food industry services are in high demand and some firms in this industry have experienced a 20% price jump in a single day (Mazur et al., 2021). Overall, the retail industry found an aggregate decline in spending of around 5% and a total decline of 13.7% in March alone (Dunn et al., 2020). On the other side of retail trade is the wholesale trade sector which is opposite to most industries that typically faced more demand shocks at the beginning of the pandemic (Brinca et al., 2020).

Other than general demand and supply shocks faced by industries, some sectors like transportation & public utilities, manufacturing, and construction also faced some logistical issues hindering their quick recovery. For the transportation sector, we can look at the air travel industry which tried to reduce the adverse connotations with it by creating solutions to reduce risk like antigen testing, quarantining, social distancing, etc. However, they could not overcome the huge logistical issue of negative sentiment, and flights were reduced by 43% in 2020 in comparison to 2019 (Bielecki et al.,2020). The manufacturing industry also had to deal with more logistics to mitigate their losses and try and repurpose or pivot their products to useful items during the pandemic. Okorie et al. (2020) explained that the manufacturing industry's response to COVID-19 has been more "…reactive and uncoordinated." This can also be seen in the construction industry as they had to react to the effects of delays, inability to secure

materials, material price escalations, and more (Alsharef et al.2021). Overall, the global construction output is expected to fall by 3.1% in 2020 and 1.7% in North America (Gamile & Alhanger,2020) Metal mining also faces similar logical challenges such as transportation of metals, prices, slower expected growth, etc. (Jowitt, 2020). Another logistical concern is found in the agriculture service industry where the migrant labor needed to get products from consumers tends to decrease due to the H-2A workers being more vulnerable to the virus and are therefore unemployed (Flocks, 2020).

The real estate industry was another one of the major industries where equity values fell dramatically. A sector study by Mazur et al. (2021) showed that real estate experienced a rapid decline in market capitalization and a drop in monthly returns of over -72%. That same study also showed a drop in the crude petroleum and oil services industry of -77% early in the pandemic. The impact of COVID-19 on the real estate industry can be seen in the possible negative effects of delayed project development, decreased sales of existing real estate, increased operation cost, a decrease in rent collection, and a general decline in business (Tanrivermis, 2020). While early on petroleum and oil may have shown a drop, another study (Iyke, 2020) found that 90 oil and gas firms reacted heterogeneously to COVID-19 which suggests reaction is firm-specific in the oil and gas industry.

On the other hand, two industries that performed well when the pandemic first hit were tech and healthcare. The healthcare industry's success is understandable as the root cause of this economic recession can primarily be solved by this industry. Similarly, the tech industry was also a major gainer in the 2020 stock market as it solved many problems created by lockdowns. Tech had a huge contribution to the recovery of the stock market as information technology and communication services carried nearly a 40% weight in the S&P500 index (Bonser-Neal &

Wang, 2020). While the entire "tech" industry is not included in this preliminary study due to its broadness in the classification system used, the communication industry should be an adequate substitute since it does contain big tech communication companies such as Verizon, Comcast, and AT&T which provide a variety of "tech" services.

Stock Returns and COVID-19 cases

Many papers have tracked the relation between coronavirus cases/deaths and stock market returns. Early studies have found that early in the pandemic stock markets were significantly affected by COVID-19 cases especially in areas where the outbreak hit quickest (Liu et al.,2020; Al-Awadhi et. al, 2020; Thakur, 2020). However, as time went on, more studies that have taken on longer or later event study windows see no significant relation in cases versus stock returns (Onali,2020). A more recent, encompassing paper by Tek Madai (2021), found that globally the changes of daily infected new cases had a severe effect on the stock returns in the first 100 days of the first identified case in the country. It also found that the relation to the changes of deaths was negative as well but statistically insignificant which is also in line with Ashraf's (2020) findings.

All these studies differ in the time frame they give their event study or the country/countries which they study. This paper hopes to add to the existing literature of COVID-19 cases versus stock market returns by analyzing the whole pandemic year in 2020 and focusing on SIC sectors and selected industries.

Sentiment vs. Substance

The final more ambiguous contribution of this paper will be the addition of evidence to reinforce the idea that market movements during COVID-19 have been caused by sentiment, not

substance. Sentiment moves markets when the overall attitude of investors towards a security not actual news or actions (substance) about the security causes a positive or negative effect on stock returns. General studies have shown that investor sentiment can predict trend continuation in index and industry stock prices (Charash et al. 2013; Huang et al. 2014).

This topic is heavily dissected in Cox et al.'s (2020) paper "What Explains the COVID-19 Stock Market?" where they found that positive sentiment caused by unconventional Federal Reserve announcements, not actual actions taken by the Federal Reserve had created approximately an 8% rise in the S&P500 and 12% raise in the Russel 2000. Negative sentiment can also be seen in the correlation between growing Google search results about COVID-19 and industry-level returns before the first case of COVID-19 was reported in the US (Goodell & Huynh, 2020).

Research Questions

Overall, the goal of this study is to contribute to the existing literature by providing stock market return information of sectors and industries a year into the pandemic. The questions that I hope to address are the following: What was the trend of certain sectors and industries a full year into the COVID-19 pandemic? Did the 2020 COVID-19 stock returns differ from typical returns? Do COVID-19 outcomes such as positive case increase and death increase influence certain sectors and industries' stock returns? And, from the outcome of the previous question, I hope to address whether sentiment or substance moves the market.

I hypothesize that returns at the end of the 2020 event study will not be the same as pre-COVID-19 returns. I also hypothesize that as previous studies showed, COVID-19 outcomes will truly only matter in the early stages of the pandemic. Many sectors and industries will eventually

have time to adapt to a more social-distanced environment, and their returns will reflect their resiliency. This research will also provide foundational research for others to compare their findings to and it will add evidence to the conclusion that the COVID-19 market was driven by sentiment, not substance.

Data

The three data sets that will be used are the S&P 500 weekly returns in 2020, single stock time-series returns from 2019-2020, and the national testing and outcome data from the COVID Tracking Project. The S&P 500 monthly returns from 2020 will be used as a comparative model to capture the effect of the COVID-19 pandemic on a major market index. This will allow us to compare the returns of a major index to large sectors and industries in the overall market. We will use the end-of-week dates to determine weekly returns data and use that to analyze how the index reacted to COVID-19 outcomes.

The largest dataset that gives single stock time-series returns over each month from 2019-2020 will give us the returns without dividends (RETX) which will be used as a dependent variable. The RETX gives us a return on performance data that allows us to see the capital appreciation of each stock. This data set provides us other important information like the month of each return on investment and the ticker for each company. It also provides a 4-digit Standard Industrial Classification (SIC) code used to classify and aggregate each company into its respective sector and industry based on the type of business activities they perform (Brown, 2020). However, not all companies have been listed under a SIC code therefore this data will be treated as sample data. We will use this dataset to group companies/stocks to their respective SIC codes, so that we can then compare the sector-level and industry-level monthly returns and use this to analyze the effects of COVID-19 in 2020, in comparison to 2019.

The COVID-19 case dataset will be provided from the COVID Tracking Project which provides a wide variety of COVID health test and outcome data that the CDC currently controls. We will use the national testing and outcomes data, and specifically use the total test results increase every day and total death increase every day as both variables show the dynamic effects

of the virus spreading. We will also scale these outcomes to a million and ten thousand respectively to show more significant returns since we are analyzing at the monthly level instead of the daily level.

For a comprehensive analysis, all SIC sectors will be analyzed. At the industry level, only 18 industries will be analyzed as they have prior research on the effects of COVID-19 on their industry. The sectors will be classified through their SIC division groupings, and the industries will be classified based on the first two digits of their SIC code. Tables 1 and Table 2 show the sectors and industries of interest and their descriptions according to the Occupational Safety and Health Administration agency (OSHA, 1987). Abbreviations have been assigned for easier representation in the results.

Table 1

SIC Sectors

SIC Sectors	Name of Sectors	Abbreviation	Description
A (1-9)	Agriculture, Forestry, Fishing	AFF	Establishment engaged in agricultural production, forestry, commercial fishing, hunting and trapping, and related services
B (10-14)	Mining	MS	Establishments engaged in mining naturally occurring minerals and gases, quarrying, well operations, milling, and related mining activities
C (15-17)	Construction	CON	Establishments that deal with general or heavy construction activities by general contractors, operative builders, and special trade contractors
D (20-39)	Manufacturing	MAN	Establishments engaged in the mechanical or chemical transformation of materials or substances into new products
E (40-49)	Transportation & Public Utilities	TNP	Establishments providing the public or other business enterprises, passenger and freight transportation, communications services
F (50-51)	Wholesale Trade	WTS	Establishments engaged in selling merchandise to retailers
G (51-59)	Retail Trade	RT	Establishments engaged in selling merchandise for personal or household consumption and rendering services incidental to the sale of goods
H (60-67)	Finance, Insurance, Real Estate	FIRE	Establishments operating primarily in the fields of finance, insurance, and real estate
I (70-89)	Services	SS	Establishments engaged in providing a variety of services for individuals, businesses, government establishments, and other organizations
J (90-99)	Public Administration	PA	Establishments involved in the executive, legislative, judicial, and administration activities of Federal, State, and local governments

Table 2

SIC Industries of Interest

SIC 2 Digit Code	Name of Industry	Abbreviation	Description
07	Agricultural Services	AS	Establishments engaged in services handling soil, crops, livestock, landscape, and horticulture
10	Metal Mining	MM	Establishments engaged in mining metal ores such as iron, copper, gold and engaged in general mining practices and services
13	Oil and Gas Extraction	OG	Establishments engaged in crude petroleum, natural gas, and gas field services such as drilling and exploration services
15	Building Construction General Contractors And Operative Builders	GC	Establishments dealing with general contractors and operative builders in residential and non-residential areas
17	Construction-Special Trade Contractors	SC	Establishments with specialized trade contractors such as plumbing, electrical, carpentry, etc.
20	Food and Kindred Products	FKP	Establishments engaged in the management of meat, dairy, bakery, beverage, and canned products
35	Industrial and Commercial Machinery and Computer Equipment	ICM	Establishments engaged in production and management of machinery in several areas such as engines, computer equipment, metalworking, etc.
45	Transportation by Air	AIR	Establishments engaged in all processes of airplane transportation
48	Communication	COM	Establishments furnishing point-to-point communication services in multiple forms
51	Wholesale Trade-Nondurable Goods	WTI	Establishments engaged in the production and management of non-durable goods such as office supplies, paper, etc.
53	General Merchandise Stores	GMS	Establishments that include retail stores which sell multiple lines of merchandise
54	Food Stores	FS	Establishments engaged in selling food for home preparation and consumption

SIC 2 Digit Code	Name of Industry	Abbreviation	Description
58	Eating and Drinking Places	EDP	Establishments selling prepared foods and drinks for consumption on the premise
65	Real Estate	RE	Establishments that include real estate operators, lessors, agents, developers, and more
72	Personal Services	PS	Establishments engaged that individual services such as laundries, repair shops, barbershops, etc.
73	Business Services	BS	Establishments that render services such as advertising or processing to other businesses
80	Health Services	HS	Establishments engaged in helping medical, surgical, and other health services to people
82	Educational Services	ES	Establishments engaged in providing academic or technical instruction

Methodology

The four methods that will be performed for this paper are descriptive statistics analysis, t-test assuming equal and unequal variances, simple linear regression, and pooled ordinary least squares (OLS) regression. A descriptive statistical analysis will be used to summarize the data of the returns of the sectors and industries of interest. A t-test will be done to assess the significance of the variation of returns between the normal and abnormal events. A simple linear regression will be done to assess the relation between COVID-19 outcomes (positive cases & deaths) and the S&P500 weekly returns. Furthermore, a pooled OLS regression will be done to assess the relationship between the monthly stock returns of sectors and industries of interest and their corresponding COVID-19 outcomes. The general principle of these methodologies comes from Anderson et al. (2021) and Sayrs (1989).

Identifying time parameters

As this research will primarily cover the COVID-19 pandemic effect on the stock market in 2020 event study methodologies must also be used. According to Peterson (1989), this will allow us to "…assess whether there are any abnormal or excess returns earned by security holders accompanying specific events." The estimation period that will be used to acquire pre-COVID behaviors of these securities will be from January 1st, 2019 to December 31st, 2019. While COVID-19 was suspected to be around during December 2019, the CDC announced the first case of COVID was confirmed on January 21st (Rettner, 2020). Since our data is based on monthly returns, we will aggregate all our sector and industry stock returns and COVID-19 outcome data into monthly frames from January 2019 to December 2020. The raw data of the monthly returns will be used to make a time series analysis chart which will allow us to examine how the market and industry returns change on a monthly and yearly basis.

Descriptive Statistics & t-test

The COVID-19 outcomes that will be analyzed are monthly positive case increases and death case increases. The descriptive statistics that will be collected are as follows: the number of companies, total observations, mean, median, standard deviation, minimum, and maximum. This will give us a good idea of the range and variance of the sector and industries returns and will allow us to compare the average returns for the event periods.

Due to the comparative nature of this research, a t-test assuming equal and unequal variances will be taken on the monthly returns of sectors and industries to prove a significant difference in the returns of 2019 to 2020. The t-test assuming equal variance will give us a t-stat that allows us to answer the following hypothesis at the 95% confidence level.

$$H_0 = \mu_1 \leq 1.96$$

$$H_a = \mu_1 > 1.96$$

In general, the null hypothesis H_0 will be that there is no relationship between COVID-19 outcomes and corresponding monthly returns while the alternative hypothesis H_a states that there is a relationship between COVID-19 outcomes and corresponding monthly returns.

Regression

Simple linear regression methods will be used throughout the study to regress monthly returns against COVID-19 outcomes. The main test using this methodology will be between weekly S&P500 index value-weighted returns without dividends against COVID-19 related outcomes. The outcomes that will be tested are the positive case increases and death increases. The general formula of the regression is as shown below.

$$E(y) = \beta_0 + \beta_1 x$$

The explanatory variables will be positive case increases and death increases. These two variables will act as x variables to explain the y variable that is the monthly return. This will return a slope β_1 that can show us the direction and the strength of returns per COVID-19 positive case increase and death case increase.

Pooled OLS Regression

While the simple linear regression or ordinary least squares (OLS) model will be used for the index return another methodology must be used for the total regression of sector and industry RETX to COVID-19 outcomes. This test is the pooled OLS regression which uses the same methodology of regular regression/OLS but is modified for panel data. Panel data has both dimensions of time series and cross-sections in one data set.

Since the panel data is heterogenous in the time series of stocks analyzed, meaning the stocks do not always have values for certain months of the event period, the data must be collectively pooled to account for each value. To pool the data each monthly return must be paired with its corresponding COVID-19 outcome of that month. This pooled data can then be regressed with a regular OLS regression model.

This methodology is used because of several factors. The main factor being that certain stocks did not exist or ended during the 2020 COVID-19 pandemic which in turn does not allow for a complete multivariate regression to be done. Furthermore, certain selected industries have an insufficient number of companies/observations in their sample to produce a significant result, but pooling the data does allow us to improve the statistical efficiency of the estimates.

Results

The followings results are shown in the order of descriptive statistics, t-test, time series, and then regression results.

Table 3

Distribution of monthly RETX by sectors in 2019-2020, 2019, & 2020

Sector	Number of companies/stocks	Number of observations	Mean	Median	Standard Deviation	Min	Max.
			2019-2020				
AFF	69	945	0.014	0.002	0.211	-0.727	2.032
MS	331	6421	0.011	-0.007	0.27	-0.878	4.745
CON	51	998	0.041	0.035	0.224	-0.721	3.538
MAN	1351	28828	0.027	0.014	0.222	-0.862	8.798
TNP	425	8812	0.014	0.008	0.233	-0.867	14.458
WTS	155	3129	0.021.	0.013	0.207	-0.806	5.197
RT	211	4368	0.030	0.013	0.260	-0.862	6.842
FIRE	4207	84488	0.01	0.010	0.100	-0.956	2.499
SS	754	14556	0.026	0.14	0.207	-0.825	6.026
PA	1660	28619	0.032	0.003	0.319	-0.923	19.884
Total	8983	181164	0.019	0.010	0.200	-0.956	19.884
			2019				
AFF	52	448	-0.004	0.003	0.144	-0.481	1.358
MS	308	3349	0.003	0.0	0.197	-0.836	1.837
CON	43	505	0.039	0.033	0.209	-0.422	3.53
MAN	1297	14460	0.021	0.015	0.178	-0.862	4.308
TNP	400	4530	0.015	0.013	0.133	-0.867	3.229
WTS	149	1615	0.012	0.013	0.142	-0.806	0.83
RT	196	2227	0.017	0.011	0.220	-0.736	6.842
FIRE	3757	41818	0.014	0.012	0.068	-0.742	1.125
SS	691	7355	0.018	0.015	0.159	-0.825	2.413
PA	1296	13463	0.017	0.003	0.295	-0.912	19.884
Total	8075	89938	0.015	0.011	0.163	-0.912	19.884
			2020				
AFF	54	497	0.030	0	0.257	-0.727	2.032
MS	287	3072	0.020	-0.016	0.335	-0.878	4.745
CON	48	493	0.044	0.038	0.238	-0.721	2.983
MAN	1245	14188	0.034	0.013	0.259	-0.777	8.798
TNP	392	4282	0.013	0.0	0.304	-0.772	14.458
WTS	139	1514	0.030	0.013	0.248	-0.725	5.197
RT	194	2151	0.044	0.017	0.296	-0.862	4.104
FIRE	3956	42670	0.006	0.008	0.123	-0.956	2.499

Sector	Number of companies/stocks	Number of observations	Mean	Median	Standard Deviation	Min	Max.
SS	670	7201	0.033	0.013	0.247	-0.791	6.027
PA	1539	15156	0.045	0.005	0.338	-0.923	7.771
Total	8398	91226	0.022	0.008	0.231	-0.956	14.458

Table 3 shows the descriptive statistics of the monthly returns of performance of all sectors A-J in the events of 2019-2020, 2019, and 2020. This gives us a general understanding of the data set used to analyze the sectors. In the first two columns, we can observe that the number of companies and observations made in 2019 and 2020 are not the same. Most sectors had an overall loss of companies/stocks as seen in sectors MS, MAN, and SS, while the others gained more companies/stocks. Overall, more companies/stocks were created from 2019 to 2020 mainly due to growth in the FIRE and PA sectors.

Table 3 also shows the central tendency through the mean and median. The mean monthly return of the 2-year event period in 2019-2020 is 0.015 or 1.5% total returns. The mean monthly returns of 2019 to 2020 increase 0.7% which is mainly carried by the positive +2% returns made in the AFF, RT, and PA sectors. In 2019 the only sectors that outperformed the total average of all the sectors were CON, MAN, RT, and SS, but in 2020 the only sectors that continued to outperform the total sector average were the CON, MAN, and RT sectors.

From these measures of central tendency, we can also measure variability and spread through standard deviation, minimum, and maximum. The standard deviation shows us that overall sectors RT and PA have the largest variability in monthly returns of companies in those sectors while the lowest variability is found in the FIRE sector.

Table 4

Distribution of monthly RETX by selected industries in 2019-2020, 2019 & 2020

Industry	Number of companies/stocks	Number of observations	Mean	Median	Standard Deviation	Min	Max.
			2019-2020				
AS	6	150	0.027	0.009	0.154	-0.287	0.862
MM	106	2086	0.041	0.012	0.205	-0.615	1.431
OG	200	3769	-0.002	-0.019	0.307	-0.878	4.745
GC	20	499	0.041	0.032	0.182	-0.721	1.336
SC	18	251	0.061	0.041	0.339	-0.642	3.538
FKP	79	1849	0.014	0.009	0.150	-0.835	1.282
ICM	161	3312	0.024	0.021	0.164	-0.862	2.283
AIR	27	582	0.016	0.017	0.173	-0.705	1.264
COM	140	2840	0.021	0.004	0.341	-0.867	14.458
WTI	55	1081	0.015	.010	0.198	-0.806	2.566
GMS	20	415	0.011	0.014	0.170	-0.726	1.142
FS	10	198	0.007	0.009	0.114	-0.421	0.368
EDP	40	900	0.023	0.013	0.191	-0.716	1.487
RE	67	1181	0.011	0.008	0.155	-0.707	0.937
PS	10	185	0.022	0.006	0.211	-0.624	1.102
BS	458	8740	0.029	0.018	0.196	-0.750	4.833
HS	60	1204	0.021	0.010	0.193	-0.773	2.413
ES	27	496	0.023	0.008	0.198	-0.571	1.227
			2019				
AS	6	67	0.018	0.008	0.098	-0.278	0.451
MM	91	1017	0.030	.019	0.165	-0.615	0.876
OG	187	2027	-0.008	-0.008	0.204	-0.836	1.837
GC	19	223	0.037	0.024	0.147	-0.376	1.336
SC	12	118	0.052	0.42	0.351	-0.422	3.538
FKP	73	919	0.017	0.013	0.146	-0.835	1.282
ICM	152	1690	0.024	0.025	0.134	-0.862	1.883
AIR	26	292	0.021	0.017	0.120	-0.434	0.822
COM	127	1443	0.007	0.005	0.151	-0.867	3.229
WTI	55	1081	0.005	0.011	0.144	-0.806	0.83
GMS	54	572	0.007	0.018	0.128	-0.726	0.471
FS	18	212	0.002	0.006	0.104	-0.394	0.322
EDP	40	464	0.013	0.009	0.119	-0.350	0.667

Industry	Number of companies/stocks	Number of observations	Mean	Median	Standard Deviation	Min	Max.
RE	56	565	0.018	0.014	0.124	-0.515	0.715
PS	11	89	0.018	0.004	0.144	-0.368	0.670
BS	417	4322	0.019	0.017	0.150	-0.727	1.788
HS	56	625	0.023	0.012	0.196	-0.508	2.413
ES	26	273	0.015	0.009	0.197	-0.419	1.227
			2020				
AS	8	83	0.027	0.009	0.154	-0.287	0.862
MM	102	1069	0.051	.005	0.236	-0.588	1.431
OG	166	1742	0.004	-0.041	0.393	-0.878	4.745
GC	19	226	0.044	0.043	0.211	-0.721	0.664
SC	15	133	0.069	0.036	0.329	-0.642	2.983
FKP	76	930	0.012	0.0	0.154	-0.518	1.274
ICM	144	1622	0.024	0.017	0.189	-0.777	2.283
AIR	25	290	0.010	0.013	0.213	-0.705	1.264
COM	129	1397	0.035	0.003	0.461	-0.746	14.458
WTI	49	509	0.026	0.006	0.245	-0.582	2.566
GMS	19	203	0.016	0.013	0.206	-0.629	1.14
FS	19	97	0.011	0.011	0.125	-0.421	0.368
EDP	38	436	0.023	0.017	0.191	-0.716	1.487
RE	61	616	0.005	0.0	0.178	-0.707	0.937
PS	8	96	0.025	0.009	0.254	-0.624	1.102
BS	413	4418	0.039	0.018	0.232	-0.750	4.833
HS	52	579	0.018	0.007	0.189	-0.773	1.469
ES	19	223	0.032	0.006	0.198	-0.571	0.906

Table 4 shows the descriptive statistics of the monthly returns of selected industries in the events of 2019-2020, 2019, and 2020. Once again, we can observe that the number of companies and observations made in 2019 and 2020 are not the same. Most industries like GMS and OG gained companies/stocks in 2020.

From the measures of central tendency, we can see that the pandemic's highest returns are found in industries GC, SC, and BS with a 4.4%, 6.9%, and 3.9% return, respectively. The lowest returns of 2020 are found in industries OG, FS, and RE. We can also see that all industries except industry MM had positive average returns throughout every event series. However, in the pandemic year, the industry does return a positive return as also seen in later analysis of this industry.

Table 5

Sectors t-test assuming equal variances and unequal variances

Sectors	t stat Assuming Equal Variances	t-stat Assuming Unequal Variances
AFF	2.434	2.501
MS	2.617	2.560
CON	0.336	0.336
MAN	5.063	5.035
TNP	-0.430	-0.422
WTS	2.426	2.387
RT	3.398	3.379
FIRE	-10.430	-10.487
SS	4.340	4.321
PA	7.549	7.610
Total	6.651	6.667

A two-sample t-test was used to test the alternative hypothesis that the returns from 2019 and 2020 are significantly different. The t-stat of 6.6 shows that there is a positive statistical difference in the returns of 2019 and 2020. Therefore, the null hypothesis H_0 that the overall monthly returns for 2020 are the same as 2019 is rejected, and we fail to reject the alternative hypothesis H_a that the overall monthly returns for 2020 are different from 2019. Most sectors show a positive statistical difference between returns in 2019 and 2020 meaning there were significant positive returns that differentiated 2020 from 2019. Certain sectors like CON and TNP show insignificant results. The main outlier is sector FIRE which showed a strong negative statistical difference in returns in 2019 and 2020.

Table 6

Industries t-test assuming equal variances and unequal variances

Industries	t stat Assuming Equal Variances	t-stat Assuming Unequal Variances
AS	0.647	0.690
MM	2.457	2.478
OG	1.128	1.083
GC	0.443	0.444
SC	0.400	0.398
FKP	-0.646	-0.646
ICM	-0.027	-0.027
AIR	-0.745	-0.744
COM	2.206	2.176
WTI	1.745	1.696
GMS	0.533	0.528
FS	0.577	0.574
EDP	1.502	1.473
RE	-1.392	-1.411
PS	0.201	0.212
BS	4.735	4.756
HS	-0.455	-0.456
ES	0.953	0.952

The t-test done at the industrial level shows there are fewer statistically significant differences in the returns. Only industries MM, COM, and BS show a significant positive difference at 95% confidence level, but the WTI and EDP industries show similar significance at the 90% confidence level. The only negative differences are seen in the FKP, ICM, AIR, RE, and HS industries. Only industry RE shows significance trending towards the 90% confidence level.

Figure 1

SIC Sectors A-J Monthly Returns from 2019-2020

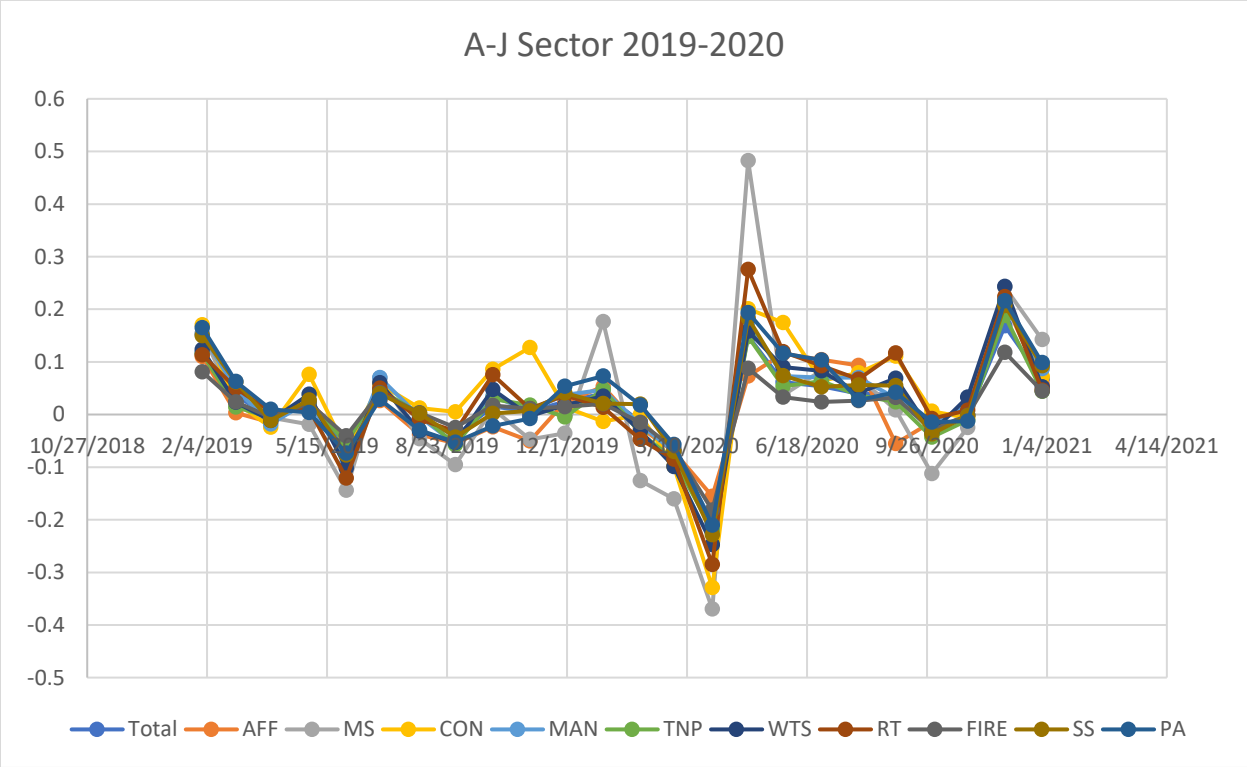


Figure 1 shows the monthly average returns in sectors A-J from 2019-2020. Here we can see possibly seasonality in the up and down returns in 2019. However, in March of 2020, the returns are negatively affected by the news and lockdowns due to the pandemic. After the recovery more sectors stabilized and had a positive plateau of returns from April until August. We can also see that the highest and lowest returns were both achieved from the MM sector just one month apart from each other.

Since each data point of Figure 1 is shown in Appendix A we can see clearly that the average monthly RETX becomes completely negative in February, and sectors have their largest losses in March. This soon followed with the largest average monthly RETX for most sectors in April. The MS, MAN, RT, and PA sectors had the most impressive recovery almost completely reversing their negative RETX just a month prior. Summing all returns we can see that that the total overall return from 2019-2020 is 44.2% and in 2019 and 2020 are 18.5% and 25.6% respectively.

Figure 2

Selected Industries Monthly Returns from 2019-2020

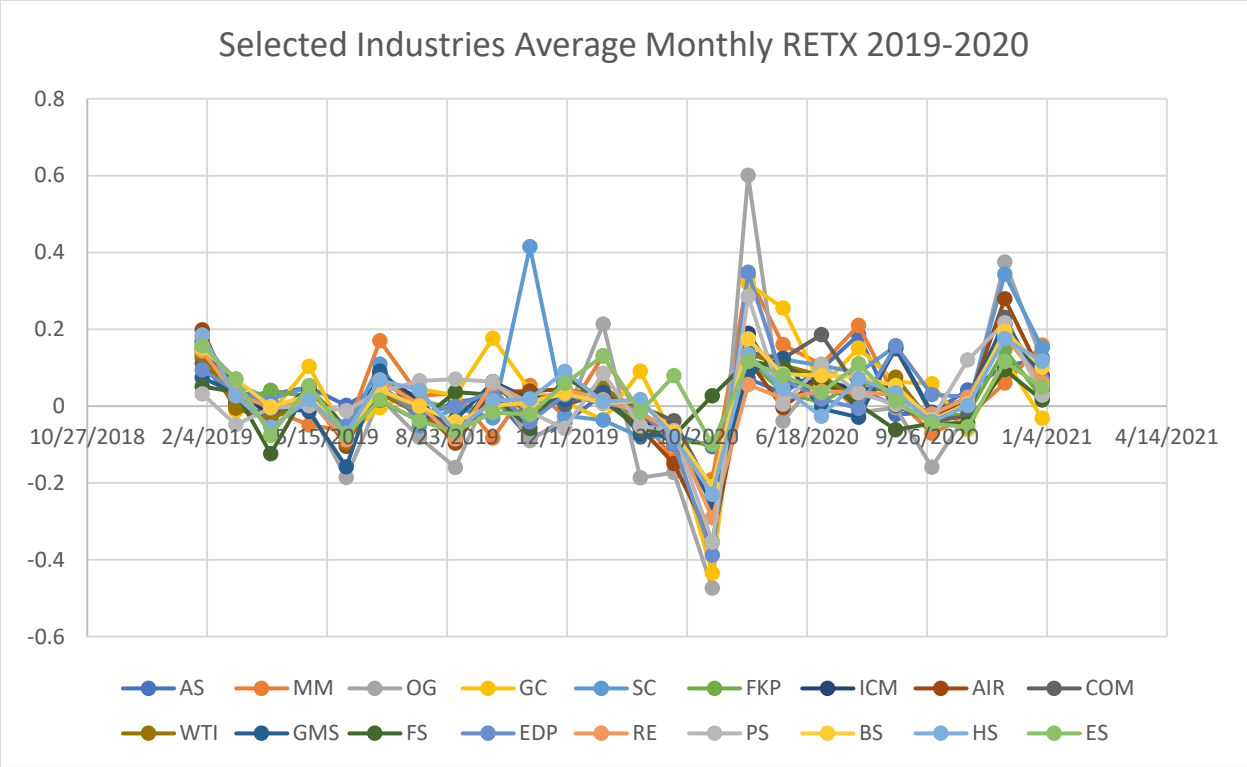
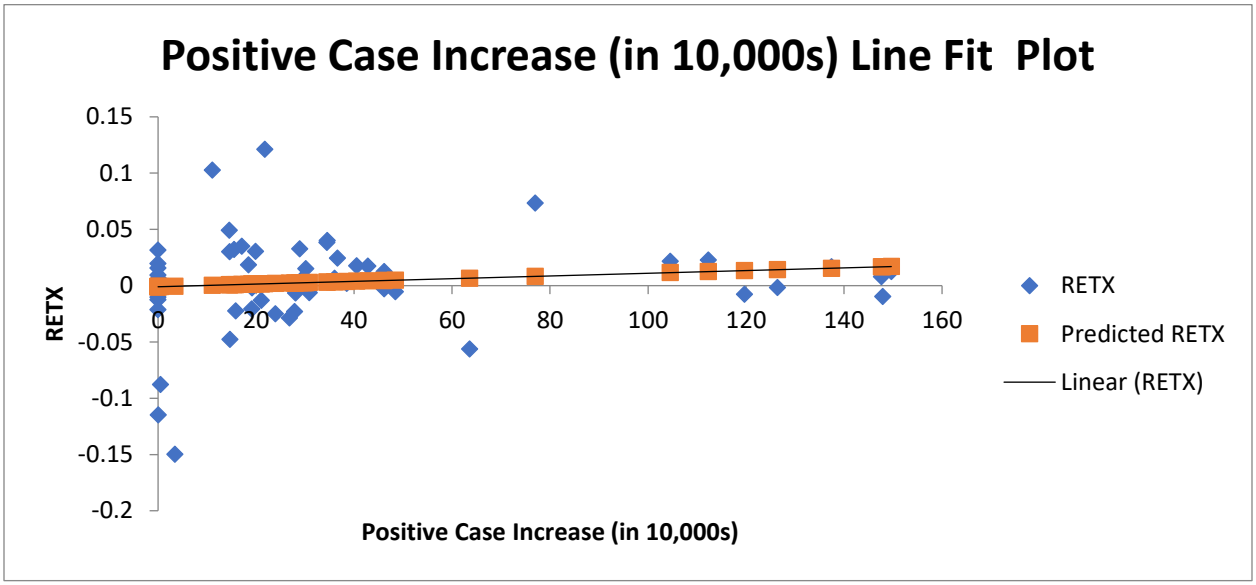


Figure 2 shows the monthly average return of selected industries from 2019-2020. In this chart, we can see the dense seasonality trends that most of these industries seem to follow. One extraneous response is seen in the sharp spike from industry SC. Looking at the original datasets the former can be explained by a drastic abnormal return caused by a penny stock in the construction industry.

By looking at appendix B we can more clearly see that yet again in February all average monthly returns were negative, and the largest losses were incurred in March. It is interesting however that in December of 2019 all stocks had a positive or near positive RETX, but in January of 2020, they all became negative except in the BS and HS industries. This could indicate that these industries had a slower or better preparatory reaction to the pandemic. Summing all average returns, we can see that the industries with the highest returns from 2019-2020 are MM, GC, and SC with returns of 95%,93%, and 122.8% respectively. These same industries also had the highest sum of average returns in 2020 with 60.4%, 50%, and 62.3% respectively. The lowest returning industries during the pandemic were industries OG, AIR, and RE with returns of 11%, 12%, and 5.1% respectively.

Figure 3

Simple Linear Regression Models for the S&P500 vs Positive case Increases



Regression Statistics	
Multiple R	0.117788
R Square	0.013874
Adjusted R Square	-0.00585
Standard Error	0.044115
Observations	52

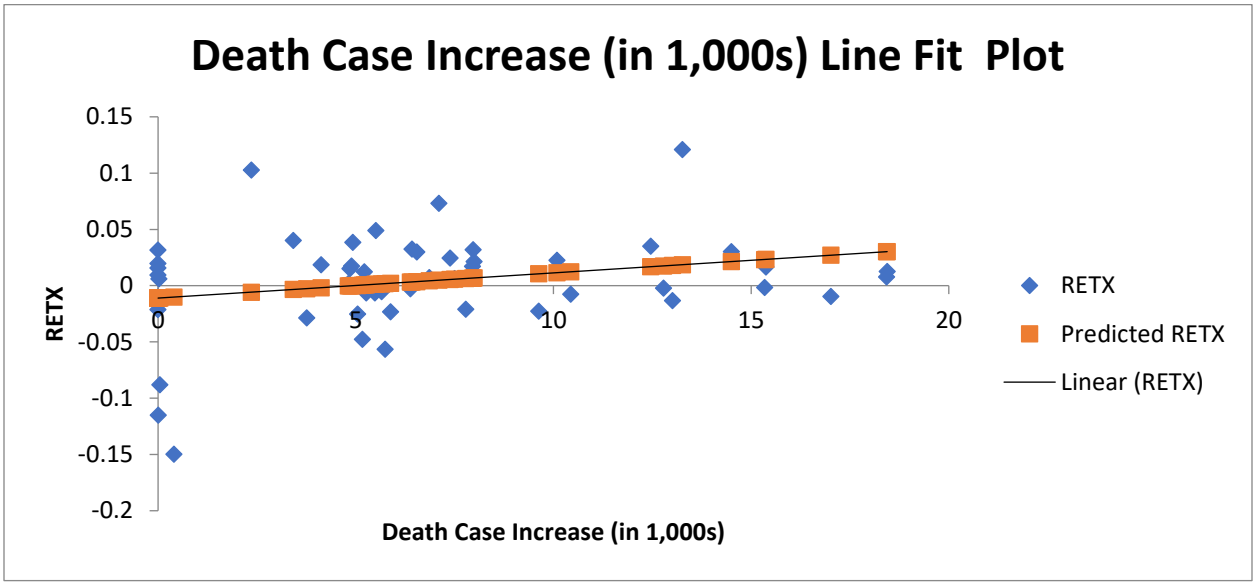
ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.001369	0.001369	0.70346	0.405615
Residual	50	0.097306	0.001946		
Total	51	0.098675			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.00098	0.008301	-0.11825	0.906346	-0.01766	0.015692	-0.01766	0.015692
Positive Case Increase (in 10,000s)	0.00012	0.000143	0.838725	0.405615	-0.00017	0.000407	-0.00017	0.000407

Figure 4

Simple Linear Regression Models for the S&P500 vs Death Increases



Regression Statistics	
Multiple R	0.261338
R Square	0.068297
Adjusted R Square	0.049663
Standard Error	0.04288
Observations	52

ANOVA

	df	*SS*	*MS*	*F*	*Significance F*
Regression	1	0.006739	0.006739	3.665192	0.061291
Residual	50	0.091936	0.001839		
Total	51	0.098675			

	Coefficients	*Standard Error*	*t Stat*	*P-value*	*Lower 95%*	*Upper 95%*	*Lower 95.0%*	*Upper 95.0%*
Intercept	-0.01104	0.009737	-1.1335	0.262411	-0.0306	0.008521	-0.0306	0.008521
Death Case Increase (in 1,000s)	0.002236	0.001168	1.914469	0.061291	-0.00011	0.004583	-0.0001	0.004583

As seen in Figures 3 and 4 there is a weak/insignificant positive correlation of 1.39% and 6.83% between the S&P500 weekly returns and the positive case increases or death increases. The ANOVA tables show that the strength of the death increase regression is trending towards significance at the 95% level, but it does show significance at the 90% level. At the 90% confidence level, there is a weak positive correlation of 6.83% for a 0.22% increase per 1000 weekly death increases due to COVID-19.

The absence of significance in these results is in line with other papers such as Liu et al. (2020), Al-Awadhi et. al, (2020), Thakur (2020), and Onali (2020).

While indexes like S&P500, NASDAQ, Dow Jones, etc. are used to show overall market trends, they are typically composed of more large-cap stocks. However, as we will see in the later regressions if you take sample data with no selection like that there are some significant results found.

Table 7

SIC Sectors A-J vs Positive Cases Increase (1,000,000) Regression Summary Statistics

Sectors	(N) # of observations	Slope	Adjusted R^2	t-stat
AFF	496	0.026	0.032	4.21
MS	3071	0.050	0.070	15.2
CON	504	0.029	0.048	5.146
MAN	14187	0.030	0.044	25.686
TNP	4281	0.027	0.025	10.593
WTS	1513	0.031	0.052	9.16
RT	2140	0.027	0.091	14.696
FIRE	42669	0.021	0.096	67.442
SS	7200	0.030	0.050	19.432
PA	15158	0.027	0.023	18.836
Total	91226	0.026	0.042	62.971

A pooled OLS regression was used to calculate the amount of variation in monthly stock returns explained by either positive case increases or death case increases.

The strength of the correlation in the total market shows a positive 2.6% monthly return per million positive case increases. All the t-stats show the statistical significance of this positive correlation found in all sectors. This is a weak correlation as seen in the total where only 4.2% of monthly stock returns is explained by COVID-19 case increase.

The sectors with a relatively stronger correlation with COVID-19 positive case increases are sectors MS and WTS. The sector with the lowest correlation is the FIRE sector

Table 8

SIC Sectors A-J vs Death Increases (in 10,000) Regression Summary Statistics

Sectors	(N) # of observations	Slope	Adjusted R^2	t-stat
AFF	496	0.024	0.037	4.52
MS	3071	0.071	0.210	28.605
CON	504	0.040	0.130	8.679
MAN	14187	0.033	0.076	34.198
TNP	4281	0.030	0.046	14.368
WTS	1513	0.034	0.087	12.037
RT	2140	0.041	0.028	7.869
FIRE	42669	0.028	0.152	87.46
SS	7200	0.033	0.086	26.086
PA	15158	0.032	0.044	26.504
Total	91226	0.029	0.075	86.235

The strength of the correlation in the total market shows a positive 2.9% monthly return per million positive case increases. All the t-stats show the statistical significance of this positive correlation found in all sectors. Due to the large dataset, the R^2 is low but still significant.

The sectors with a relatively stronger correlation with death increases are sectors MS, CON, and RT. The sector with the lowest correlation is the AFF sector.

Table 9

Positive Case Increase (in 1,000,000s) Regression

Industry	(N) # of observations	Slope	Adjusted R^2	t-stat
AS	83	0.028	0.063	2.554
MM	1064	0.025	0.038	6.593
OG	1738	0.064	0.082	12.411
GC	226	0.006	-0.002	0.737
SC	133	0.048	0.072	3.348
FKP	929	0.019	0.050	7.095
ICM	1618	0.031	0.090	12.709
AIR	290	0.032	0.153	7.284
COM	1395	0.046	0.007	3.284
WTI	509	0.022	0.036	4.444
GMS	203	0.026	0.092	4.621
FS	96	0.035	0.003	1.116
EDP	436	0.008	0.046	4.705
RE	612	0.030	0.111	8.810
PS	96	0.026	0.036	2.130
BS	4380	0.032	0.053	15.626
HS	571	0.030	0.112	8.528
ES	223	0.029	0.005	1.486

Table 9 shows the correlation between industries' monthly returns and positive case increases. All t-test show significant results except in the GC, FS, and ES industries. However, the ES industry is trending towards significant at the 90% confidence level. All correlations are still weak, but the relatively higher correlated industries are the OG, SC, and COM industries. The negative R^2 in the GC states that the model is insignificant in explaining the coefficient.

Table 10

Death Case Increase (in 10,000s) Regression

Industry	(N) # of observations	Slope	Adjusted R^2	t-stat
AS	83	0.024	0.067	2.624
MM	1064	0.049	0.202	16.459
OG	1738	0.086	0.222	22.302
GC	226	0.036	0.134	5.994
SC	133	0.041	0.065	3.198
FKP	929	0.022	0.091	9.715
ICM	1618	0.036	0.168	18.082
AIR	290	0.042	0.178	7.985
COM	1395	0.026	0.014	4.621
WTI	509	0.030	0.070	6.242
GMS	203	0.037	0.146	5.952
FS	96	0.016	0.068	2.821
EDP	436	0.048	0.182	9.891
RE	612	0.027	0.109	8.711
PS	96	0.038	0.096	3.335
BS	4380	0.032	0.092	21.052
HS	571	0.034	0.149	10.054
ES	223	0.014	0.021	2.386

Table 10 shows the correlation between industries' monthly returns and death increases. All correlations are still weak, but there are more industries with higher correlations of monthly returns to death increases than positive case increases. The t-stats show that all coefficients are significant. The relatively higher correlated industries are the MM, OG, and EDP industries. The lowest correlated industries are the AS, FS, and ES industries.

Conclusion

The COVID-19 stock market has been one of the fastest recovering market shocks in history. At the time of writing, most indices are either near or above their pre-COVID range. This paper tests whether sectors and industries have similar recoveries by analyzing if they have statistically different returns from 2019 to 2020, and it tests whether yearlong COVID-19 outcomes of positive case and death increases still affect returns. By comparing monthly stock data returns in 2019 and 2020 we have found that there is variation in these returns.

The t-test shows that overall, there is a significant positive difference to the monthly returns between 2019 and 2020, meaning the overall stock market had increased returns from 2019 to 2020 regardless of the global pandemic. Significant differences are also seen in all sectors except in the construction sector and transportation & public utilities sector. It is surprising to see no difference in the latter sector as a big industry that faced demand shocks, air transportation, was in this sector. However, we can see in our t-test at the industry level the communications industry had a significant positive difference and is also in the transportation & public utilities sector. This could balance the returns in the transportation & public utilities sector to show no statistical difference. The other two industries that showed significant positive differences at the industry level were metal mining and business services. Overall, this means that at the sector level it is easier to see differences than at the industry level between the returns in 2019 and 2020. However, there are limitations to this test which are discussed later.

The time series analysis can help show the difference in these monthly returns mainly in the fact that in both event periods there was a total return increase of 44.2% from all the 2019-2020 returns. Looking at 2019 and 2020 alone there was an 18.5% and 25.6% total sum of returns respectively which shows a 7.1% difference in returns. The only sectors that showed a

lower return in 2020 than 2019 were the transportation & public utilities sector and finance, insurance, & real estate sector. This aligns with their negative t-stats as well.

Through the regression analysis, we can conclude that from a yearlong perspective overall there is a weak positive correlation between COVID-19 outcomes and the SIC sectors and most industries' returns. We can also confirm that with each test there is a stronger correlation of monthly returns to death increases than to positive case increases. This is a surprising result as most would assume an inverse relationship between COVID-19 outcomes and returns, but from a yearlong perspective, the direction of the relationship has changed. This shows that COVID-19 outcomes no longer have a negative explanatory effect on the stock market. These contrary yearlong results of positive correlations and switched strengths of explanatory variables can confirm previous studies' results that show the majority of the negative correlation between the stock market and COVID-19 outcomes was only seen in earlier weeks/months of the pandemic (Onali, 2020; Madai, 2021; Ashraf, 2020).

From this outcome, we can contribute to the sentiment vs substance debate by showing that from a yearlong perspective the increases in COVID-19 outcomes no longer have a negative effect on the stock market. This shows that regardless of the continued escalation of the pandemic, the returns for sectors and industries follow sentiment, not substance.

Some limitations to this study are that not all companies are not listed as SIC-coded companies. Therefore, in certain industries analyzed like agricultural services, only eight companies were used as a small sample of the industry. The effect of that limitation also caused the limitation of performing a t-test with unequal sample sizes which requires assuming no autocorrelation and randomness in the missing variables. Another current limitation is that the data of our stock returns are only limited until December 31, 2020. This limits us from using

more recent data from March which is critical as the pandemic is still going on, and this limits the use of using another COVID-19 outcome of vaccinations that started rolling out in late December 2020. In congruence, the stock return data has some limitations to doing a true event study since the returns were only recorded monthly which would prevent an accurate event study to be done.

A follow-up study that could be conducted is one that analyzes the timing of the depression and recovery of certain sectors or industries. This would require more specific and chronologically consistent data to pinpoint the dates that changes were noticed. Another research question that would be possible to study with the data given is the influence of vaccination affecting the sector and industry returns. This would allow us to contribute more to the substance vs. sentiment debate as a new analysis of vaccinations could also play a role in returns. The final research question that could be answered with the data collected is what industries had the greatest influence on a nation's GDP the most. This would require other countries' sector and industry stock return data.

APPENDIX A: SIC A-J SECTORS AVERAGE RETURNS

	A	B	C	D	E	F	G	H	I	J	Total
1/31/2019	0.11	0.155	0.17	0.152	0.116	0.124	0.113	0.081	0.15	0.165	0.117
2/28/2019	0.003	0.017	0.023	0.048	0.014	0.023	0.05	0.024	0.061	0.063	0.036
3/29/2019	-0.015	-0.006	-0.024	-0.018	-0.006	-0.012	0.005	-0.005	-0.011	0.01	-0.006
4/30/2019	0.025	-0.019	0.076	0.026	0.023	0.038	0.01	0.022	0.028	0.004	0.019
5/31/2019	-0.049	-0.144	-0.067	-0.095	-0.054	-0.102	-0.121	-0.041	-0.077	-0.073	-0.065
6/28/2019	0.027	0.069	0.058	0.07	0.047	0.061	0.05	0.041	0.04	0.029	0.046
7/31/2019	-0.038	-0.046	0.012	-0.004	0.002	-0.031	-0.009	0.003	0.002	-0.03	-0.006
8/30/2019	-0.055	-0.096	0.005	-0.056	-0.058	-0.053	-0.032	-0.025	-0.043	-0.053	-0.041
9/30/2019	-0.024	0.011	0.086	0.034	0.029	0.047	0.076	0.017	0.002	-0.022	0.015
10/31/2019	-0.05	-0.047	0.127	0.007	0.018	-0.003	0.011	0.011	0.007	-0.007	0.006
11/29/2019	0.023	-0.035	0.014	0.038	-0.004	0.018	0.037	0.015	0.041	0.054	0.024
12/31/2019	0.053	0.177	-0.013	0.047	0.048	0.035	0.013	0.02	0.021	0.073	0.04
1/31/2020	-0.025	-0.126	0	-0.019	-0.035	-0.031	-0.048	-0.015	0.019	0.018	-0.014
2/28/2020	-0.07	-0.16	-0.098	-0.07	-0.086	-0.099	-0.085	-0.065	-0.07	-0.057	-0.071
3/31/2020	-0.156	-0.37	-0.329	-0.204	-0.22	-0.247	-0.285	-0.182	-0.228	-0.21	-0.206
4/30/2020	0.073	0.482	0.201	0.177	0.148	0.158	0.276	0.088	0.183	0.194	0.149
5/29/2020	0.116	0.037	0.175	0.073	0.054	0.09	0.119	0.033	0.074	0.116	0.061
6/30/2020	0.104	0.084	0.064	0.07	0.064	0.083	0.093	0.024	0.053	0.103	0.053
7/31/2020	0.093	0.071	0.079	0.07	0.037	0.041	0.067	0.027	0.056	0.027	0.04
8/31/2020	-0.055	0.008	0.111	0.031	0.024	0.069	0.117	0.033	0.055	0.042	0.037
9/30/2020	-0.014	-0.113	0.006	-0.02	-0.043	-0.034	-0.007	-0.03	-0.037	-0.014	-0.029
10/30/2020	0.015	-0.025	-0.007	0.017	-0.011	0.033	0.008	-0.002	-0.002	-0.013	-0.001
11/30/2020	0.215	0.242	0.216	0.207	0.188	0.244	0.224	0.118	0.207	0.216	0.168
12/31/2020	0.057	0.143	0.072	0.087	0.044	0.053	0.047	0.045	0.093	0.099	0.068

APPENDIX B: SIC SELECTED INDUSTRIES AVERAGE RETURNS

	7	10	13	15	17	20	35	45	48	51	53	54	58	65	72	73	80	82
1/31/2019	0.167	0.153	0.165	0.181	0.17	0.126	0.148	0.198	0.111	0.134	0.074	0.051	0.094	0.143	0.032	0.151	0.185	0.157
2/28/2019	0.032	0.016	0.016	-0.012	0.057	0.012	0.051	0.006	0.006	-0.006	0.033	0.037	0.04	0.031	-0.048	0.07	0.027	0.071
3/29/2019	0.031	-0.008	-0.003	-0.019	0.018	0.041	-0.029	-0.029	-0.024	-0.036	-0.002	-0.124	0.007	-0.003	-0.005	-0.002	-0.055	-0.077
4/30/2019	0.049	-0.049	-0.006	0.103	0.05	0.024	0.046	0.04	0.011	0.021	-0.014	0.05	0.007	0.015	0.001	0.028	0.017	0.053
5/31/2019	0.002	-0.065	-0.186	-0.077	-0.067	-0.073	-0.095	-0.105	-0.058	-0.097	-0.158	-0.058	-0.052	-0.088	-0.012	-0.073	-0.071	-0.075
6/28/2019	0.054	0.17	0.022	-0.004	0.109	0.033	0.083	0.082	0.035	0.033	0.091	0.015	0.049	0.067	0.037	0.042	0.068	0.016
7/31/2019	-0.024	0.027	-0.082	0.044	-0.052	0.016	0.016	0.001	-0.001	-0.021	-0.024	-0.039	-0.02	0.004	0.066	-0.001	0.041	-0.039
8/30/2019	0.01	0.033	-0.16	0.028	-0.004	-0.008	-0.081	-0.097	-0.065	-0.084	-0.036	0.037	-0.001	-0.086	0.07	-0.041	-0.067	-0.066
9/30/2019	0.026	-0.083	0.059	0.177	-0.031	0.001	0.063	0.037	0.01	0.06	0.062	0.029	0.039	0.058	0.063	0.001	0.014	-0.017
10/31/2019	-0.084	0.053	-0.09	0.042	0.415	-0.018	0.018	0.039	0.023	-0.024	0.013	-0.058	-0.042	0.008	-0.016	0.009	0.018	-0.022
11/29/2019	-0.043	-0.027	-0.032	0.011	-0.025	0.02	0.032	0.044	0.004	0.026	0.017	0.077	0.029	0.044	-0.058	0.033	0.09	0.059
12/31/2019	0.031	0.131	0.213	-0.036	-0.037	0.027	0.037	0.022	0.031	0.05	0.035	0.014	0.007	0.017	0.085	0.008	0.012	0.131
1/31/2020	-0.038	-0.026	-0.187	0.091	-0.08	-0.044	-0.032	-0.057	-0.001	-0.019	-0.074	-0.059	-0.008	-0.018	-0.052	0.013	0.017	-0.015
2/28/2020	-0.074	-0.14	-0.173	-0.084	-0.081	-0.09	-0.1	-0.15	-0.038	-0.088	-0.077	-0.077	-0.099	-0.065	-0.064	-0.068	-0.081	0.079
3/31/2020	-0.106	-0.191	-0.474	-0.435	-0.252	-0.099	-0.231	-0.354	-0.225	-0.207	-0.252	0.027	-0.388	-0.291	-0.354	-0.209	-0.23	-0.1
4/30/2020	0.072	0.341	0.601	0.319	0.099	0.118	0.189	0.121	0.139	0.137	0.089	0.118	0.348	0.056	0.286	0.175	0.135	0.116
5/29/2020	0.034	0.16	-0.039	0.255	0.122	0.037	0.051	-0.004	0.124	0.107	0.123	0.101	0.07	0.02	0.005	0.083	0.046	0.08
6/30/2020	0.097	0.108	0.083	0.051	0.106	0.009	0.068	0.078	0.186	0.079	-0.007	0.065	0.018	0.038	0.108	0.079	-0.027	0.035
7/31/2020	0.186	0.21	-0.017	0.151	0.087	0.065	0.042	-0.006	0.043	0.014	-0.029	0.004	-0.006	0.036	0.034	0.076	0.071	0.11
8/31/2020	-0.022	0.022	-0.004	0.063	0.157	0.027	0.052	0.149	0.001	0.075	0.152	-0.062	0.157	0.029	0.004	0.053	0.034	0.013
9/30/2020	-0.017	-0.071	-0.159	0.058	-0.026	-0.029	-0.038	-0.019	-0.039	-0.044	-0.017	-0.045	0.03	-0.021	-0.035	-0.037	-0.04	-0.046
10/30/2020	0.042	-0.027	-0.017	-0.061	-0.003	-0.021	0.011	0.004	-0.026	0.01	0.021	-0.045	0.024	0.022	0.12	0.006	0.002	-0.054
11/30/2020	0.103	0.06	0.375	0.122	0.343	0.147	0.197	0.279	0.231	0.211	0.215	0.095	0.181	0.183	0.217	0.195	0.175	0.116
12/31/2020	0.125	0.158	0.12	-0.032	0.152	0.021	0.078	0.08	0.041	0.047	0.072	0.016	0.068	0.061	0.028	0.101	0.117	0.049

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